Fuel Cell Gas Diffusion Layer

Abstract

The present invention provides a fuel cell gas diffusion layer comprising a hydrophilic surface layer having a thickness of no more than 1 micron, and, thereunder, a hydrophobic second layer comprising a fluoropolymer having a thickness of at least 5 microns. Additionally, the present invention provides a method of making a fuel cell gas diffusion layer comprising the steps of a) providing a carbon fiber construction; b) coating at least the upper surface of the carbon fiber construction with composition which comprises a fluoropolymer; and c) exposing the upper surface to at least one plasma, such as a silane plasma, so as to generate a hydrophilic surface layer having a thickness of no more than 1 micron. The present invention also provides a method additionally comprising the step of partially covering the upper surface with a mask having windows according to a pattern, such that the hydrophilic surface layer is applied according to the pattern. The present invention also provides a method wherein the carbon fiber construction is provided as a roll good and the step of exposing said upper surface to at least one plasma is performed in continuous roll-to-roll fashion.